

What is Claimed is:

1. A dual capacity compressor comprising:

a power generating part including a reversible motor and a crank shaft inserted in the motor;

5 a compression part including a cylinder, a piston in the cylinder, and a connecting rod connected to the piston;

a crank pin in an upper part of the crank shaft eccentric from an axis of the crank shaft;

10 an eccentric sleeve having an inside circumferential surface rotatably fitted to an outside circumferential surface of the crank pin, and an outside circumferential surface rotatably fitted to an end of the connecting rod;

a key member configured such that the key member is held at at least a part of the eccentric sleeve, and held at the eccentric sleeve additionally during operation, for latching the eccentric sleeve with the crank pin positively in all rotation directions of the motor; and
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thereby providing different compression capacities by re-arranging the eccentric sleeve that changes an effective eccentricity and a piston displacement following change of a direction of rotation of the motor, and preventing relative motion between the crank pin and the eccentric sleeve during operation by means of the key member actually
20 regardless of the direction of rotation of the motor.

2. The dual capacity compressor as claimed in claim 1, wherein the key member catches the eccentric sleeve at a plurality of points.

25 3. The dual capacity compressor as claimed in claim 1, wherein the key

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member catches the eccentric sleeve at two points set up with reference to a center line in any direction during operation.

4. The dual capacity compressor as claimed in claim 1, wherein the key
5 member has a length greater than an outside diameter of the crank pin.

5. The dual capacity compressor as claimed in claim 1, wherein the key
member is continuously held at at least a part of the eccentric sleeve relatively
positioned on a radial direction inner side of the crank shaft.
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6. The dual capacity compressor as claimed in claim 1, wherein the key
member includes;
a first projection for continuous projection beyond the crank pin by a
predetermined length, and
15 a second projection for projection beyond the crank pin by a predetermined
length only during operation.

7. The dual capacity compressor as claimed in claim 6, wherein the first
projection is projected continuously in a radial direction inner side.
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8. The dual capacity compressor as claimed in claim 1, wherein the key
member prevents rotation of the eccentric sleeve coming from a centrifugal force, and a
consequential rotational moment.

25 9. The dual capacity compressor as claimed in claim 1, wherein the key

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member is continuously held at at least a part of the eccentric sleeve so that a rotational moment is generated at the eccentric sleeve in a direction opposite to the rotation direction of the crank shaft.

5 10. The dual capacity compressor as claimed in claim 1, wherein the key member is continuously held at at least a part of the eccentric sleeve relatively positioned on a radial direction outer side of the crank shaft.

10 11. The dual capacity compressor as claimed in claim 1, wherein the key member includes;

 a first projection for continuous projection beyond the crank pin, and

 a second projection for continuous projection beyond the crank pin, and being held at the eccentric sleeve during operation of the compressor.

15 12. The dual capacity compressor as claimed in claim 1, wherein the first projection is projected toward a radial direction outer side of the crank shaft.

 13. The dual capacity compressor as claimed in claim 11, wherein the second projection is projected beyond the crank pin such that the second projection does not
20 interfere with the eccentric sleeve when the compressor is stationary.

 14. The dual capacity compressor as claimed in claim 11, wherein the second projection includes a channel for passing the eccentric sleeve when the compressor is stationary.

15. The dual capacity compressor as claimed in claim 1, wherein the key member includes a stopper positioned in the crank pin for limiting movement of the key member.

5 16. The dual capacity compressor as claimed in claim 15, wherein the stopper has a contact surface to the crank pin formed to fit to an inside circumferential surface of the crank pin.

17. The dual capacity compressor as claimed in claim 15, wherein the stopper is
10 a first stopper for limiting movement of the key member in one direction.

18. The dual capacity compressor as claimed in claim 17, wherein the stopper further includes a second stopper for limiting movement of the key member in an opposite direction.

15 19. The dual capacity compressor as claimed in claim 15, wherein the key member further includes an elastic member for supporting the key member to project at least a part of the key member beyond the crank pin continuously regardless of a state of operation of the compressor.

20 20. The dual capacity compressor as claimed in claim 19, wherein the elastic member limits movement of the key member in one direction.

21. The dual capacity compressor as claimed in claim 19, wherein the elastic
25 member has a non-uniform elastic force.

22. The dual capacity compressor as claimed in claim 19, wherein the elastic member has a part with an elastic force relatively greater than other part.

5 23. The dual capacity compressor as claimed in claim 19, wherein the elastic member has a part with an elastic force greater than a centrifugal force generated at the key member.

24. The dual capacity compressor as claimed in claim 19, wherein the elastic
10 member includes;

a first elastic member in contact with the key member, and

a second elastic member in contact with the first elastic member and the inside circumferential surface of the crank pin respectively, having an elastic force greater than the first elastic member.

15 25. The dual capacity compressor as claimed in claim 24, wherein the second elastic member has an elastic force greater than the centrifugal force generated at the key member.

20 26. The dual capacity compressor as claimed in claim 24, wherein the first elastic member is a spring with a predetermined diameter, and the second elastic member is a spring continuous to the first elastic member with a diameter greater than the first elastic member.

25 27. The dual capacity compressor as claimed in claim 1, wherein the crank pin

includes one pair of key member fitting parts opposite to each other.

28. The dual capacity compressor as claimed in claim 27, wherein the key member fitting part in the crank pin is a through hole in a wall of the crank pin.

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29. The dual capacity compressor as claimed in claim 27, wherein the key member fitting part in the crank pin includes at least one slot extended from a top end of a wall of the crank pin to a position of the wall.

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30. The dual capacity compressor as claimed in claim 1, wherein the eccentric sleeve includes;

a track part formed along a direction of extension of a body thereof itself for enabling rotation of the projection of the key member, and

a limiting part formed relative to the track part for limiting rotation of the projection of the key member.

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31. The dual capacity compressor as claimed in claim 30, wherein the track part of the eccentric sleeve is a cut away part starting from a top end of the eccentric sleeve to a required depth extended along a circumference direction.

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32. The dual capacity compressor as claimed in claim 30, wherein the steps between the track part and the limiting part are parallel to a plane containing both a longitudinal axis of the crank shaft and a longitudinal axis of the crank pin.

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33. The dual capacity compressor as claimed in claim 30, wherein the steps are

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spaced from a plane containing both a longitudinal axis of the crank shaft and a longitudinal axis of the crank pin by a half of a thickness of the key member, respectively.

5 34. The dual capacity compressor as claimed in claim 30, wherein the step is sloped at an angle from a plane containing both a longitudinal axis of the crank shaft and a longitudinal axis of the crank pin by a half of a thickness of the key member.

 35. The dual capacity compressor as claimed in claim 1, wherein the eccentric
10 sleeve further includes a ring member provided between a bottom surface of the eccentric sleeve and a top surface of the crank shaft.

 36. The dual capacity compressor as claimed in claim 1 or 30, wherein the eccentric sleeve further includes a balance weight for preventing breaking away of the
15 eccentric sleeve from the key member due to rotation before the key member latches the eccentric sleeve perfectly by shifting a center of gravity of the eccentric sleeve.

 37. The dual capacity compressor as claimed in claim 36, wherein the balance weight prevents rotation of the eccentric sleeve by a rotational moment.

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 38. The dual capacity compressor as claimed in claim 36, wherein the balance weight prevents the rotational moment from generating at the eccentric sleeve.

 39. The dual capacity compressor as claimed in claim 36, wherein the balance
25 weight positions the center of gravity of the eccentric sleeve on a plane containing both

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a longitudinal axis of the crank shaft and a longitudinal axis of the crank pin.

40. The dual capacity compressor as claimed in claim 36, wherein the balance weight rotates the eccentric sleeve in a direction that the eccentric sleeve is to be engaged with the key member.

41. The dual capacity compressor as claimed in claim 36, wherein the balance weight generates the rotational moment in a direction opposite to the rotation direction.

42. The dual capacity compressor as claimed in claim 36, wherein the balance weight shifts the center of gravity of the eccentric sleeve to position opposite with respect to a plane containing both a longitudinal axis of the crank shaft and a longitudinal axis of the crank pin.

43. The dual capacity compressor as claimed in claim 36, wherein the balance weight is provided to a part of the eccentric sleeve having a relatively light weight.

44. The dual capacity compressor as claimed in claim 36, wherein the balance weight is provided to the track part of the eccentric sleeve.